

Grade 9 EQAO Assessment of Mathematics

Academic

Student Preparation Booklet

Name: _____

Teacher: _____

School: _____

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Grade 9 EQAO Assessment of Mathematics

Key Words

Throughout the assessment, key words are used to identify the type of response required from you. The key words are explained below. Refer to this sheet to make sure you are responding fully to each question.

Compare:

Tell what is the same and what is different.

Describe:

Use words to create a mental picture for the reader.

Determine:

Use mathematics to find a solution to the problem.

List:

Use point form.

Explain:

Use words and symbols to make your solution clear.

Justify:

Give reasons and evidence to show your answer is correct.

Show your work:

Record all calculations and all the steps you went through to get your answer. You may use words, numbers, graphs, diagrams, symbols and/or charts.

Tools you should have access to:

- Pencil, ruler and eraser
- Scientific or Graphing calculator (You may not share with another student)
- Manipulatives (examples: fraction pieces, algebra tiles, linking cubes, integer counters, 3D solids, 2D shapes ...)

Strategies for Multiple Choice Questions:

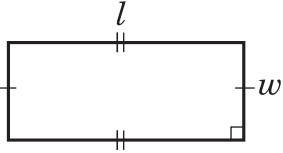
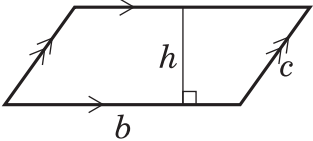
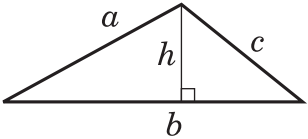
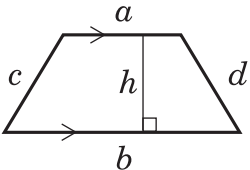
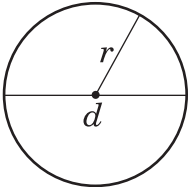
1. Cover the question choices and read the question stem carefully and highlight key words with a highlighter, especially the key words on the previous page.
2. Look at the choices and eliminate any of the responses that are not possible.
3. There is only **one** answer per question. Choose the best possible answer and shade your choice on the answer sheet.
4. Answer every question; there are no penalties for guessing.
5. Questions that have a graph are drawn to scale. Questions that have a diagram are usually not drawn to scale.

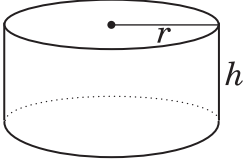
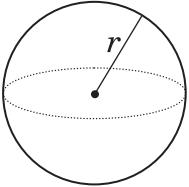
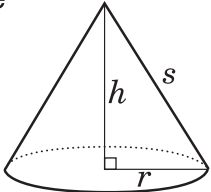
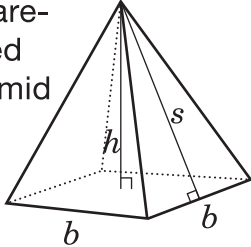
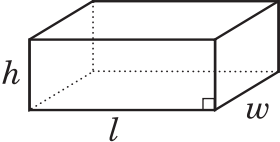
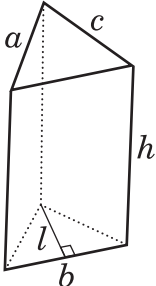
Strategies for Open Response Questions:

1. These questions are asking you to show what you know and what you can do. Complete solutions including any rough work are expected for these questions. Give as much information as you can.
2. Read the question carefully and highlight any key words or information with a highlighter.
3. Write your solution in the space provided. Try to give a clear well-organized solution to illustrate your complete understanding and ability to communicate. Write your solution so they can be understood by someone who does not know your work.
4. Don't erase any of your calculations, drawing or reasoning. Scorers want to see all your work.
5. Use the list of key words on the previous page to help you decide what is expected in your answer. For example, "show your work" means, *record all calculations and all the steps you went through to get your answer. You may use words, numbers, graphs, diagrams, symbols and/or charts.*
6. The problems in these questions often have more than one way of being solved. Be sure to clearly explain your solution using graphs, tables, pictures numbers or words.
7. When using a calculator, write down all the numbers you use and the operations you carry out. For example to find the area of a circle of diameter 7cm you need to write $A = \pi(3.5)^2 \approx 38.485\text{cm}^2$.

Formula Sheet

Grade 9 Academic

Geometric Figure	Perimeter	Area
<p>Rectangle</p> 	$P = l + l + w + w$ or $P = 2(l + w)$	$A = lw$
<p>Parallelogram</p> 	$P = b + b + c + c$ or $P = 2(b + c)$	$A = bh$
<p>Triangle</p> 	$P = a + b + c$	$A = \frac{bh}{2}$ or $A = \frac{1}{2}bh$
<p>Trapezoid</p> 	$P = a + b + c + d$	$A = \frac{(a + b)h}{2}$ or $A = \frac{1}{2}(a + b)h$
<p>Circle</p> 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

Geometric Figure	Surface Area	Volume
Cylinder 	$A_{\text{base}} = \pi r^2$ $A_{\text{lateral surface}} = 2\pi r h$ $A_{\text{total}} = 2A_{\text{base}} + A_{\text{lateral surface}}$ $= 2\pi r^2 + 2\pi r h$	$V = (A_{\text{base}})(\text{height})$ $V = \pi r^2 h$
Sphere 	$A = 4\pi r^2$	$V = \frac{4}{3} \pi r^3 \quad \text{or} \quad V = \frac{4\pi r^3}{3}$
Cone 	$A_{\text{lateral surface}} = \pi r s$ $A_{\text{base}} = \pi r^2$ $A_{\text{total}} = A_{\text{lateral surface}} + A_{\text{base}}$ $= \pi r s + \pi r^2$	$V = \frac{(A_{\text{base}})(\text{height})}{3}$ $V = \frac{1}{3} \pi r^2 h \quad \text{or} \quad V = \frac{\pi r^2 h}{3}$
Square-based pyramid 	$A_{\text{triangle}} = \frac{1}{2} b s$ $A_{\text{base}} = b^2$ $A_{\text{total}} = 4A_{\text{triangle}} + A_{\text{base}}$ $= 2bs + b^2$	$V = \frac{(A_{\text{base}})(\text{height})}{3}$ $V = \frac{1}{3} b^2 h \quad \text{or} \quad V = \frac{b^2 h}{3}$
Rectangular prism 	$A = 2(wh + lw + lh)$	$V = (A_{\text{base}})(\text{height})$ $V = lwh$
Triangular prism 	$A_{\text{base}} = \frac{1}{2} b l$ $A_{\text{rectangles}} = ah + bh + ch$ $A_{\text{total}} = A_{\text{rectangles}} + 2A_{\text{base}}$ $= ah + bh + ch + bl$	$V = (A_{\text{base}})(\text{height})$ $V = \frac{1}{2} blh \quad \text{or} \quad V = \frac{blh}{2}$

Academic

Grade 9 Assessment of Mathematics

2012

RELEASED ASSESSMENT QUESTIONS

**Record your answers to the multiple-choice questions
on the Student Answer Sheet (2012, Academic).**

Education Quality and
Accountability Office



Please note: The format of
this booklet is different from
that used for the assessment.
The questions themselves
remain the same.

Directions






Make sure you have the following materials:

- Student Answer Sheet
- the Formula Sheet
- a pencil and an eraser
- a ruler
- a scientific or graphing calculator
- some paper for rough work for multiple-choice questions only

The diagrams in this booklet are **not** all drawn to scale.

Answering Multiple-Choice Questions

When answering the multiple-choice questions, be sure you use Student Answer Sheet. The circles you will be filling in are lettered a, b, c, d.

1. Try to answer all of the multiple-choice questions. Be sure to read each question and its four answer choices carefully. Do not spend too much time on any one question.
2. To indicate your answer, **use a pencil to fill in the circle completely** on Student Answer Sheet. Like this:  Not like this:    
3. If you fill in more than one answer to a question, the question will be scored zero.
4. If you leave a question blank, the question will be scored zero.
5. Cleanly erase any answer you wish to change and fill in the circle for your new answer.

Answering Open-Response Questions

1. Do all of your work (even your rough work) in this booklet.
2. Present a complete and well-organized solution to each question. Give as much information as you can.
3. Write your solutions so that they can be understood by someone who does not know your work.
4. Make sure you follow the directions on the Key Words page.
For example, a question might ask you to “Show your work.” Read the Key Words page. It says to record all calculations and steps. So, if you sketch a graph in the process of getting to your answer, show the sketch and label it.
5. When using a calculator, write down the numbers you use and the operations you carry out.
For example, a question might ask you to “Find the area of a circle with a radius of 7 cm.” You need to write $A = \pi(7)^2$ as well as the answer you get on your calculator.

- 1** What is the value of the expression x^2 when $x = \frac{4}{5}$?

a $\frac{8}{5}$
b $\frac{8}{10}$
c $\frac{16}{5}$
d $\frac{16}{25}$

- 2** The volume of a rectangular prism is represented by $12x^3$. The height is represented by $3x$.
Which of the following represents the area of the base?

Hint:

$$V = (\text{area of base})(\text{height})$$

a $4x^2$
b $4x^3$
c $9x^2$
d $9x^3$

- 3** A basketball player scores 28 points in a game. She scores 35% of the total team points.

How many points does her team score in total?

a 63
b 65
c 72
d 80

- 4** Which of the expressions below is equivalent to $3(4x - 5) - 7(9x - 2)$?

a $-51x - 1$
b $-51x - 3$
c $-51x - 7$
d $-51x - 29$

- 5** Liam sells sandwiches at an arena. He earns \$10.50 per hour plus \$0.40 for each sandwich he sells.

How many sandwiches does he need to sell during a 6-hour shift to earn \$125?

a 158
b 155
c 62
d 12

6 What a Bargain!

Susan buys a tennis racket from a store.

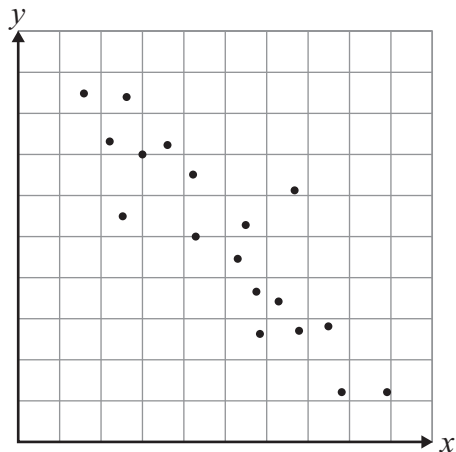
- The tennis racket's original price is \$75.
- All tennis rackets are on sale for 25% off the original price.
- The tennis racket has a scratch, so she receives an additional 10% off the sale price.

How much does Susan pay for her tennis racket, including 13% tax?

Show your work.



7 Consider the graph below.



- Which relationship is most likely to be represented by this graph?
- a height vs. weight
 - b pay vs. number of hours worked
 - c gas remaining vs. distance travelled
 - d volume of water in a bucket vs. its mass

8 The figures below are made with sticks of equal length. Figure 1 is made with 4 sticks.

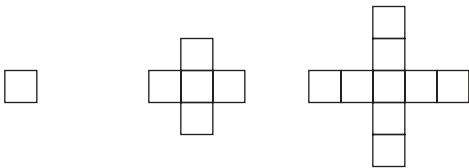


Figure 1 Figure 2 Figure 3

The pattern continues in the same way. Which table shows the relationship between the number of sticks, S , and the figure number, n ?

a

n	S
1	4
2	20
3	36

b

n	S
4	40
5	52
6	64

c

n	S
3	12
4	16
5	20

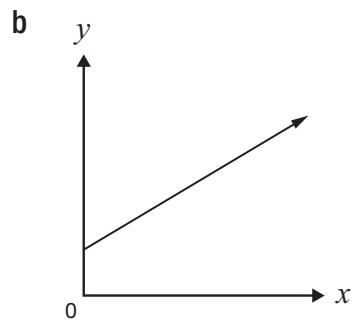
d

n	S
5	17
6	21
7	25

- 9** Which of the following represents a non-linear relation?

a

x	y
1	1
2	4
3	9
4	16



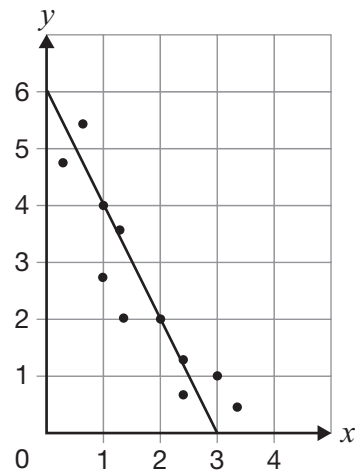
c

$y = 2x + 3$

d

x	y
4	8
3	5
2	2
1	-1

- 10** A line of best fit is drawn on the scatter plot below.

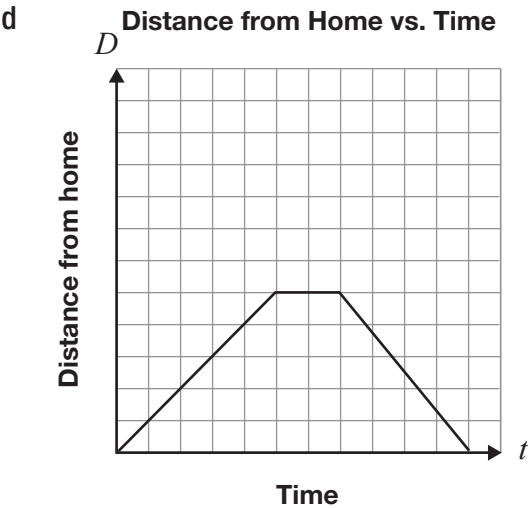
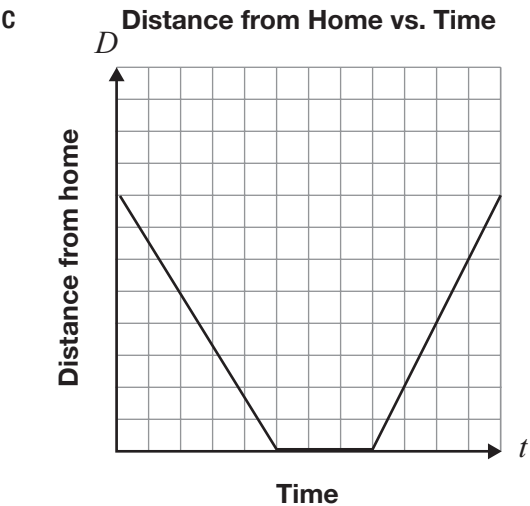
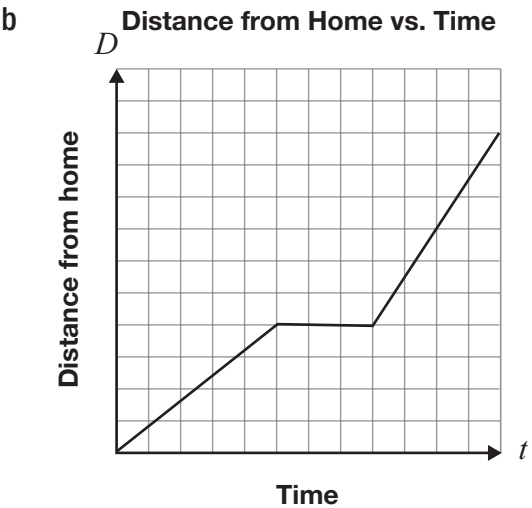
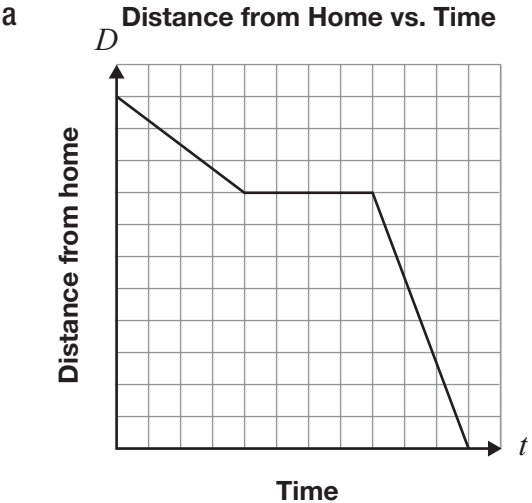


The slope of the line is -2 .

Which equation represents the line?

- a** $y = 6x - 2$
b $y = 3x - 2$
c $y = -2x + 3$
d $y = -2x + 6$

11 Bruno leaves home and goes for a run along a straight path. He runs to the park, stops for a rest and returns home. Which graph best represents his run?



- 12** Abigail buys a prepaid card for her cellphone. When she talks on her phone, a fee per minute is deducted from the value of the prepaid card.

The table below shows information about the remaining value of the card.

Total number of minutes used, t	Remaining value, V (\$)
10	22.00
20	19.00

Which equation represents the relationship between the remaining value and total number of minutes used?

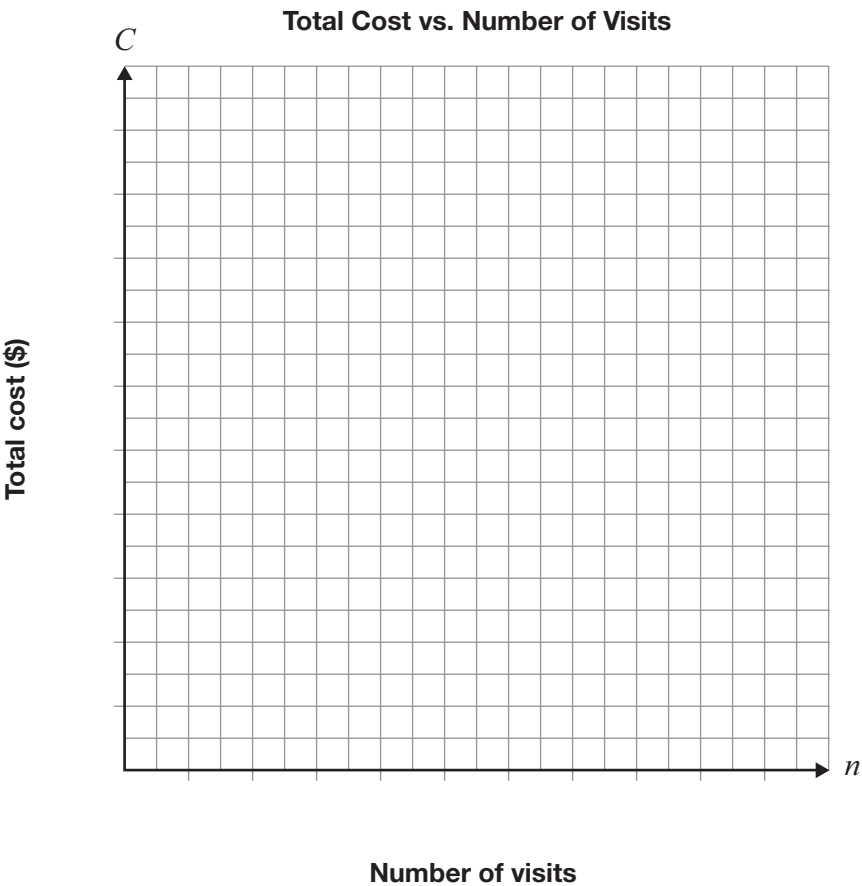
- a $V = 22 - 3t$
- b $V = 22 - 0.30t$
- c $V = 25 - 3t$
- d $V = 25 - 0.30t$



13 Which Is Which?

A relationship between the total cost to use a gym for a month, C , and the number of visits, n , is a partial variation. The total cost for 10 visits during one month is \$50.

Draw a graph that could represent this relationship. Label each axis with an appropriate scale.



Determine the equation for your graph.

$C =$ _____

Explain how you know your equation represents a partial variation.

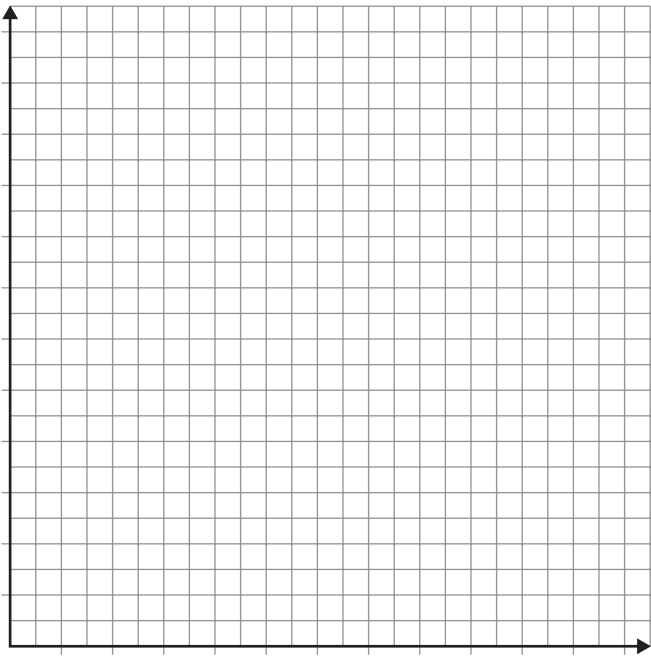
14 Counting Pennies

Identical pennies are placed in a container and the total mass is recorded.

The table below gives information about the total mass of different numbers of pennies in the container.

Number of pennies	Total mass (g)
4	60
6	65
10	75

Use the data to determine the number of pennies in the container when the total mass is 185 g.
Justify your answer. You may use the grid if you wish.



- 15** Which of the following equations does **not** represent a line?

a $x = 5$
b $y = 10$
c $xy = 10$
d $5x - y + 10 = 0$

- 16** Which of the following is the equation $4x - 5y + 12 = 0$ in the form $y = mx + b$?

a $y = \frac{4}{5}x + \frac{12}{5}$
b $y = \frac{5}{4}x - 3$
c $y = 4x - 7$
d $y = 5x + 16$

- 17** Consider the equation $y = mx + 5$.

If $(7, 3)$ is a point on the line represented by this equation, which of the following is true?

a The rise is 8 when the run is 7.
b The rise is 7 when the run is 8.
c The rise is -2 when the run is 7.
d The rise is 7 when the run is -2 .

- 18** Consider the relation $y = -3x + 5$.

Which of the following statements about the graph of this relation is **not** true?

a The slope is 3.
b The y -intercept is 5.
c For a rise of 3, the run is -1 .
d The graph crosses the y -axis at $(0, 5)$.

- 19** The total cost of swimming at a community swimming pool is made up of a membership fee and a cost per swim.

At this community centre, Jake pays a total of \$100 and swims 40 times. Paula pays a total of \$70 and swims 25 times.

Which of the following statements is true?

a The membership fee is \$20.
b The membership fee is \$30.
c The cost per swim is \$2.50.
d The cost per swim is \$2.80.

- 20** A local fair charges a \$15 entry fee and \$1.75 per ride. Dustin has \$35 to spend.

What is the maximum number of rides Dustin can go on?

a 8
b 11
c 12
d 20

- 21** In the relation $C = 60 + 15n$, C represents the total cost of holding an event at a hall, and n represents the number of guests.

The maximum number of guests allowed in the hall is 100.

What are the minimum and maximum possible values for C ?

- a \$0, \$1500
- b \$0, \$1560
- c \$60, \$1500
- d \$60, \$1560



22 Know Your Lines

Consider the equations of the two lines below.

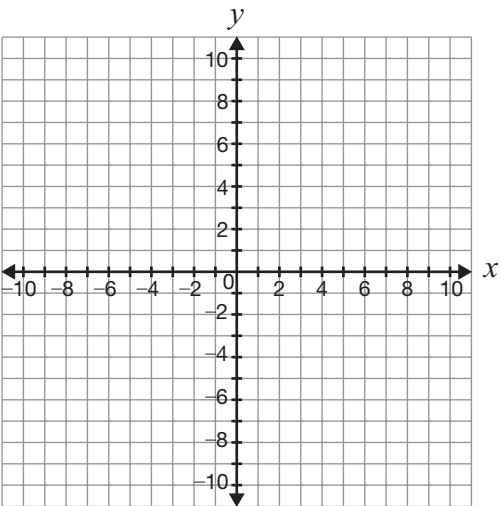
Line A: $y = -\frac{3}{2}x - 7$

Line B: $y = \frac{2}{3}x - 4$

Compare Line A and Line B. You may use the grid if you wish.

Justify your answers.

Complete the table below.



Characteristic	Comparison of Line A and Line B, with justification
Direction from left to right	
Steepness	
Parallel, perpendicular or neither	

23 Reduce, Reuse and Recycle

A high school is starting a recycling program.

The relationship between the total cost of the program, C , and the number of recycling bins, n , is represented by the equation $C = 48n + 75$.

The school must install a minimum of 12 recycling bins and has a maximum of \$1000 to spend on the program.

What are the possible values of C and n in this situation?

Justify your answer.

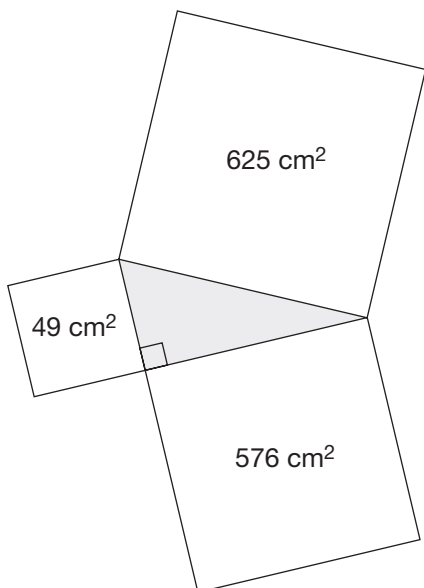
The possible values of n are _____.

The possible values of C are _____.

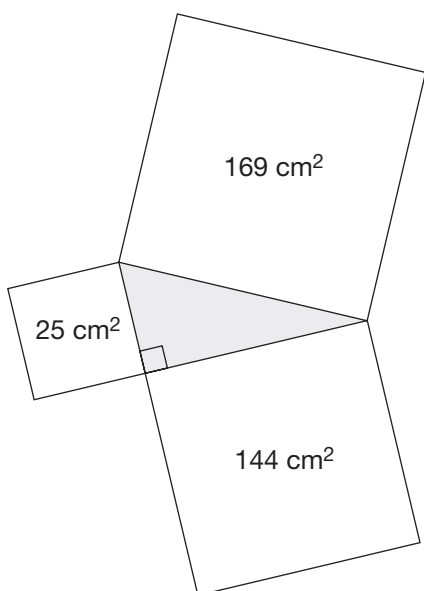
- 24** Each of the diagrams below shows a right triangle and a square constructed on each of its sides.

According to the Pythagorean theorem, which diagram is **not** correct?

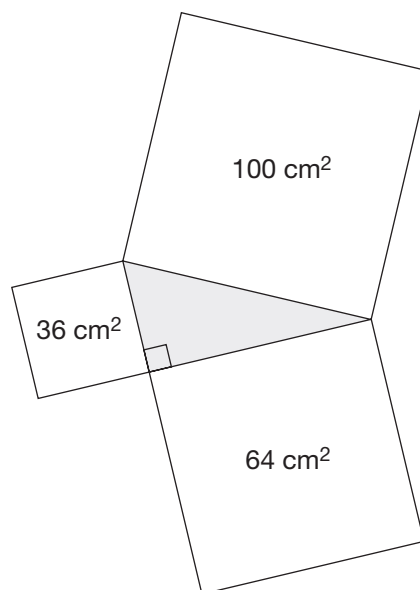
a



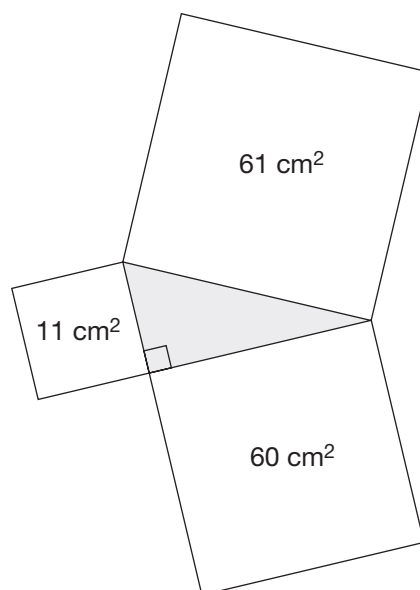
b



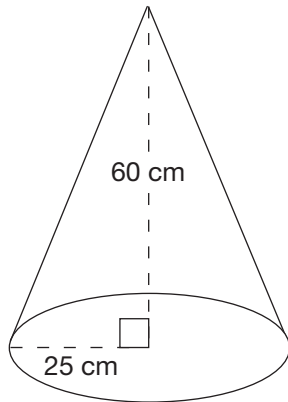
c



d



- 25** A pylon in the shape of a cone is shown below.

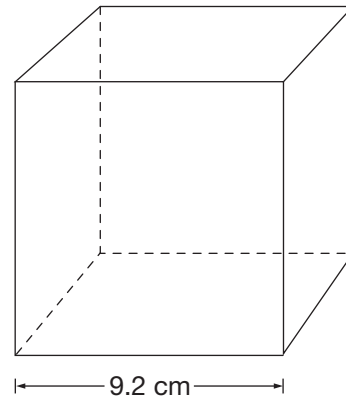


The outside surface of the cone is to be painted, but the bottom will not be painted.

Which of the following is closest to the total surface area to be painted?

- a 4284 cm^2
- b 4713 cm^2
- c 5105 cm^2
- d 5350 cm^2

- 26** A decoration is packed in a box shaped like a cube as shown below.



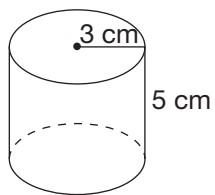
The decoration has a volume of 651 cm^3 .

Approximately how much empty space remains in the box?

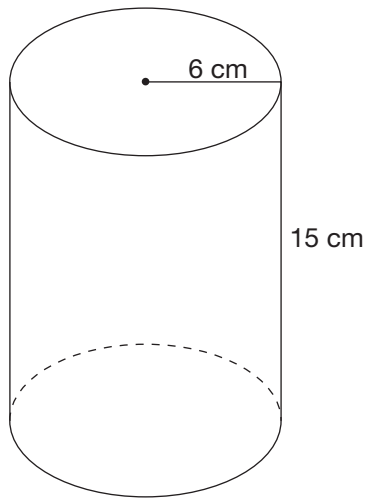
- a 128 cm^3
- b 143 cm^3
- c 623 cm^3
- d 779 cm^3

- 27** Two different cylindrical containers are shown below.

Container 1



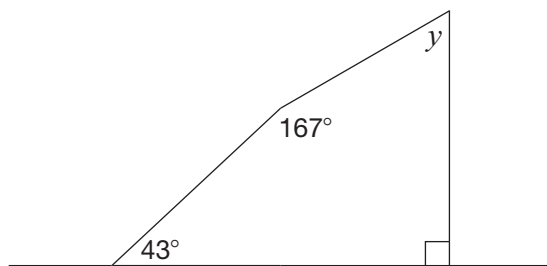
Container 2



When the containers are full of milk, what is the ratio of the amount in Container 1 to the amount in Container 2?

- a 1:2
- b 1:3
- c 1:6
- d 1:12

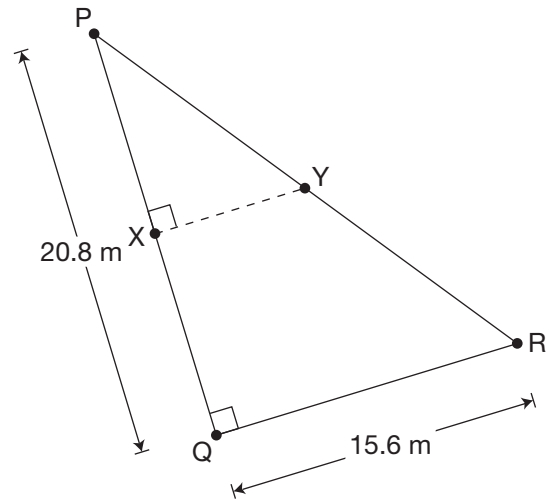
- 28** Consider the diagram below.



What is the value of y ?

- a 43°
- b 60°
- c 137°
- d 150°

- 29** Consider the right triangle below.



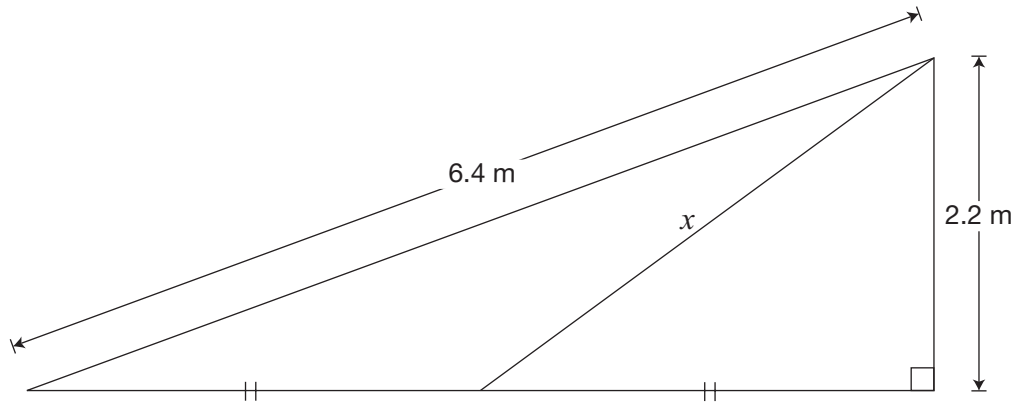
Line segment XY connects the midpoint of PQ to the midpoint of PR .

What is the length of XY ?

- a 5.2 m
- b 7.8 m
- c 10.4 m
- d 13.0 m

30 All the Right Stuff

The diagram below shows a small right triangle inside a large right triangle.



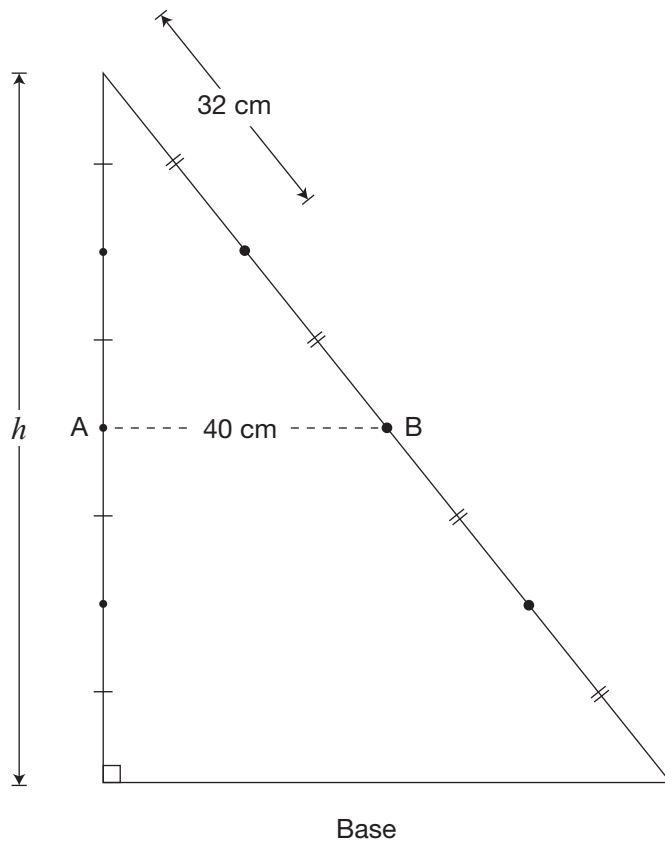
Determine the value of x .

Show your work.



31 Tricky Triangle

Line segment AB joins the midpoints of two sides of the triangle below. The length of AB is half the length of the base of the triangle.



Determine the value of h in the diagram.

Show your work.

Released Assessment Questions: Academic

Student Answer Sheet

Your multiple-choice answers must be entered on this sheet.

- To indicate your answer, **use a pencil to fill in the circle completely.**

Like this: ● **Not like this:** ⊗ ✓ ◐ ◑

- Do not fill in more than one answer to a question.
- Do not leave a question blank.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)

2. (a) (b) (c) (d)

3. (a) (b) (c) (d)

4. (a) (b) (c) (d)

5. (a) (b) (c) (d)

6. Respond in booklet.

7. (a) (b) (c) (d)

8. (a) (b) (c) (d)

9. (a) (b) (c) (d)

10. (a) (b) (c) (d)

11. (a) (b) (c) (d)

12. (a) (b) (c) (d)

13. Respond in booklet.

14. Respond in booklet.

15. (a) (b) (c) (d)

16. (a) (b) (c) (d)

17. (a) (b) (c) (d)

18. (a) (b) (c) (d)

19. (a) (b) (c) (d)

20. (a) (b) (c) (d)

21. (a) (b) (c) (d)

22. Respond in booklet.

23. Respond in booklet.

24. (a) (b) (c) (d)

25. (a) (b) (c) (d)

26. (a) (b) (c) (d)

27. (a) (b) (c) (d)

28. (a) (b) (c) (d)

29. (a) (b) (c) (d)

30. Respond in booklet.

31. Respond in booklet.

End of Assessment

Print Student Name: _____

Student Signature: _____



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Academic

Grade 9 Assessment of Mathematics

2011

SAMPLE ASSESSMENT QUESTIONS

**Record your answers to the multiple-choice questions
on the Student Answer Sheet (2011, Academic).**

Education Quality and
Accountability Office



September 2012

Please note: The format of
this booklet is different from
that used for the assessment.
The questions themselves
remain the same.

Page 29 of 68

Directions

Make sure you have the following materials:

- Student Answer Sheet
- the Formula Sheet
- a pencil and an eraser
- a ruler
- a scientific or graphing calculator
- some paper for rough work for multiple-choice questions only

The diagrams in this booklet are **not** all drawn to scale.

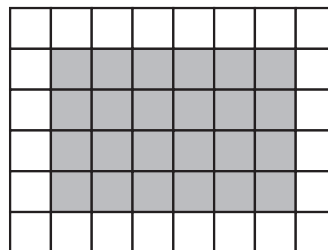
Answering Multiple-Choice Questions

When answering the multiple-choice questions, be sure you use the Student Answer Sheet. The circles you will be filling in are lettered a, b, c, d.

1. Try to answer all of the multiple-choice questions. Do not leave a question blank.
2. Be sure to read each question and its four answer choices carefully. When you choose an answer, fill in the appropriate circle on the Student Answer Sheet. Do not spend too much time on any one question.
3. Mark only one answer for each question. Do not fill in more than one circle for a question.
4. To make a correction, cleanly erase the answer you wish to change and fill in the circle for your new answer.
5. Now do the following sample question. Fill in your choice in the sample row.

Sample Question

- 1** Find the area of the shaded region of the rectangle below.



 1 square unit

- a** 16 square units
- b** 24 square units
- c** 30 square units
- d** 36 square units

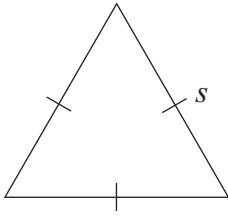
Sample Row on Answer Sheet

1. ☐ a ☒ b ☐ c ☐ d

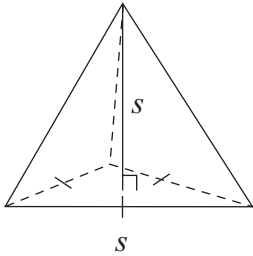
You should have filled in **(b)**.

- 1** Which of the following has a volume that can be represented by s^3 ?

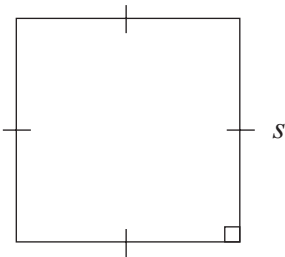
a



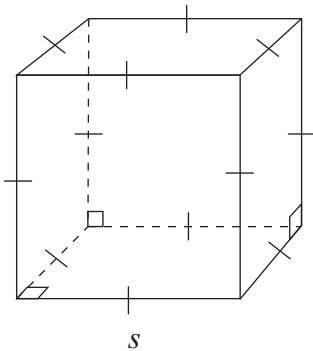
b



c



d



- 2** What value of m makes the equation

$$\frac{6a^m}{2a^3} = 3a^5 \text{ true?}$$

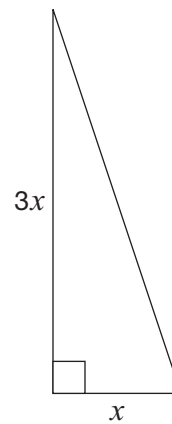
- a 2
- b 8
- c 15
- d 18

- 3** What is the value of the expression

$$\frac{5(-18 + 12)}{-4 + 1}?$$

- a 10
- b 6
- c -6
- d -10

- 4** Luke designs a garden in the shape of a right triangle as shown below.



The total area of the garden is 96 m^2 .

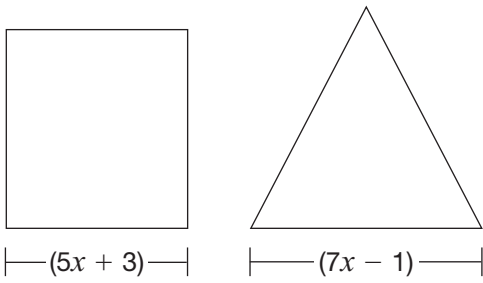
Hint:

$$A = \frac{1}{2}bh$$

Which is closest to the value of x in the diagram?

- a 6 m
- b 8 m
- c 32 m
- d 64 m

- 5** A square and an equilateral triangle are pictured below.



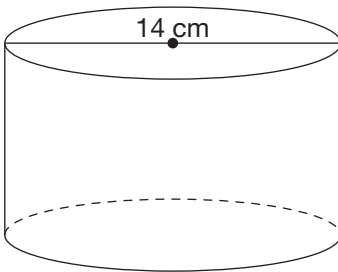
If the square and the triangle have the same perimeter, what is the value of x ?

- a 2
- b 4
- c 9
- d 15



6 How High Is It?

The cylinder pictured below has a surface area of 660 cm^2 .



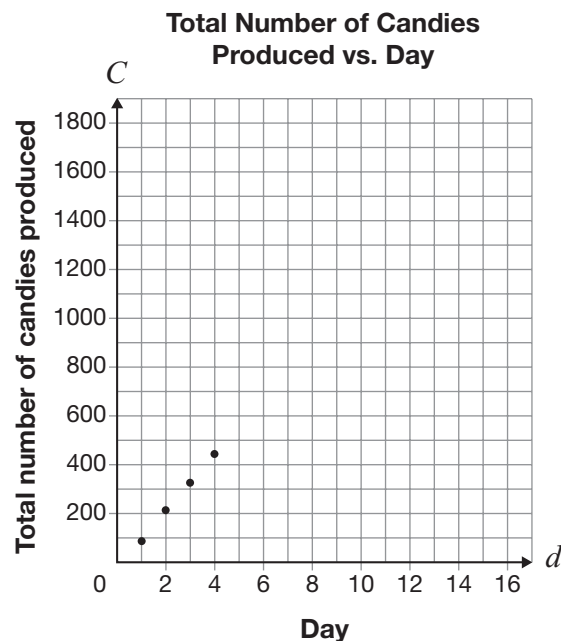
Use the following formula to determine the height of the cylinder:

$$\text{Surface area} = 2\pi r^2 + 2\pi rh$$

Show your work.



- 7** Dechen has a candy-making business. The graph below shows the total number of candies his business has produced by the end of each day for the first four days.



If this trend continues, which of the following points represents a day with more candies produced than expected?

- a (5, 500)
- b (9, 850)
- c (10, 1300)
- d (14, 1400)

- 8** Karina has a job at a video store. The total she is paid each week is made up of an hourly rate plus \$14 for transportation.

One week, she works 20 hours and is paid \$215.

Which equation represents the relationship between Karina's total pay, P , in dollars, and the number of hours she works, n ?

- a $P = 10.75n + 14$
- b $P = 14n + 10.75$
- c $P = 10.05n + 14$
- d $P = 14n + 10.05$



- 9** Which table of values shows a linear relation between C and n ?

a

n	C
0	0
1	2
2	4
3	8

b

n	C
0	0
1	1
2	4
3	9

c

n	C
0	0
1	4
2	11
3	15

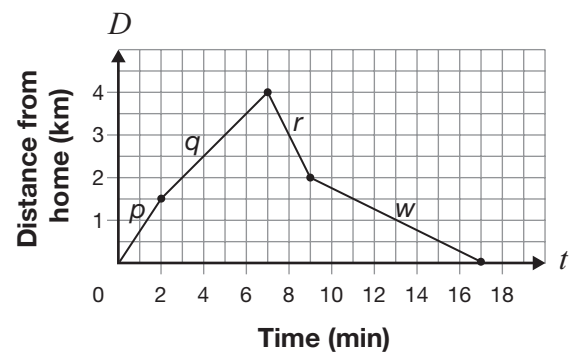
d

n	C
0	0
1	3
2	6
3	9

- 10** Which relation does **not** have an initial value of 50?

- a** $y = 50$
b $y = 50 + 8x$
c $y = 50x$
d $y = 50 - x$

- 11** The graph below represents the relationship between Rena's distance from home and time.



During which section of the graph does Rena travel the fastest?

- a** p
b q
c r
d w

- 12** The table below represents a linear relation.

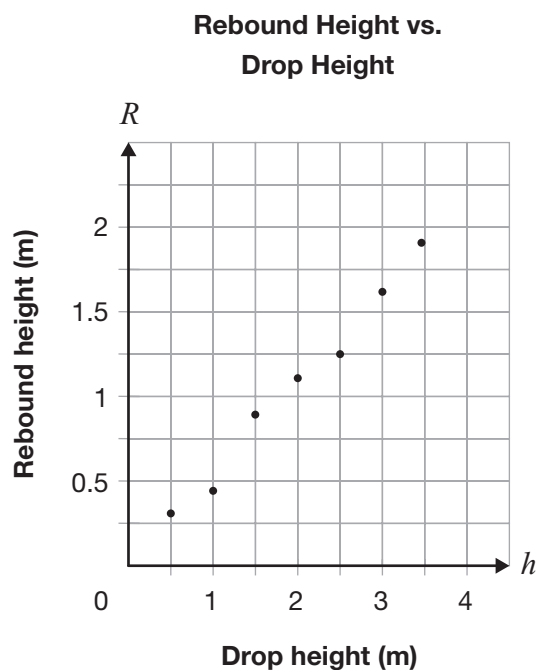
Time, t	Distance, D
0	5
1	15
2	25
3	35
4	45

Which equation represents this relation?

- a** $D = 5t$
b $D = 10t$
c $D = 10t + 5$
d $D = 5t + 10$

13 Follow the Bouncing Ball

This scatter plot shows the relationship between the rebound height of a ball and the height from which the ball is dropped.



Draw a line of best fit for the data on the grid above.

Determine an equation for your line of best fit.

Show your work.

Equation of line of best fit: _____

14 Getting Paid

Hannah's total pay includes a base salary and a percent of her sales.

The following table shows her total pay for three different sales levels.

Sales (\$)	Total pay (\$)
15 000	1700
17 500	1825
28 000	2350

Determine Hannah's total pay when her sales are \$47 000.

Show your work.



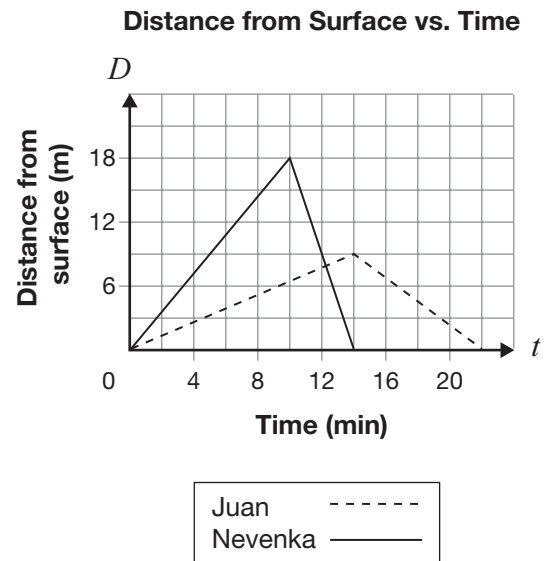
15 Which of the following **cannot** be an equation of a line?

- a $x = 2$
- b $y = 7$
- c $y = 2x^2 + 7$
- d $2x + y + 7 = 0$

16 Which of the following is the equation of the line $6x - 2y - 12 = 0$ in the form $y = mx + b$?

- a $y = -3x + 6$
- b $y = 3x - 6$
- c $y = -\frac{1}{3}x + 12$
- d $y = \frac{1}{3}x - 12$

17 Nevenka and Juan scuba dive. The graph below represents the relationship between the distance from the surface, in metres, and time, in minutes, for both divers as they swim down from the surface and then swim back up.



Which statement below is true?

- a Juan swims back up at a rate of 0.5 m/min.
- b Nevenka swims back up at a rate of 4.5 m/min.
- c Nevenka swims down faster than she swims back up.
- d Juan swims down and back up at the same rate.

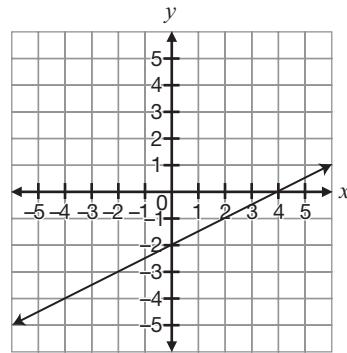
- 18** Alex has \$150. She spends the same amount each week. After 6 weeks, she has \$30 remaining.

The relationship between the amount of money Alex has and the number of weeks is represented by a line. What is the slope of this line?

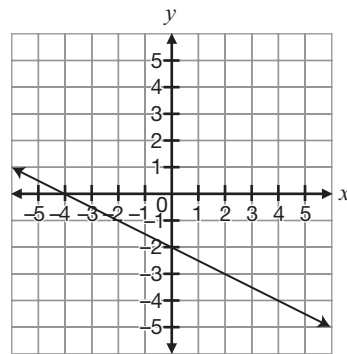
- a -25
- b -20
- c 20
- d 25

- 19** Which of the following represents the graph of the equation $2x - 4y = 8$?

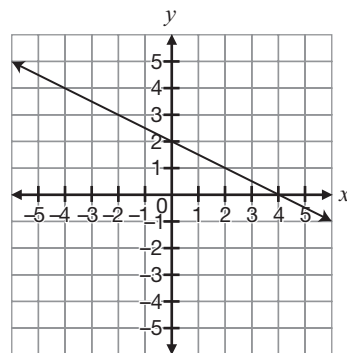
a



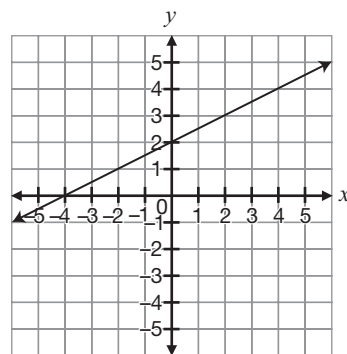
b



c



d



20 Which equation represents a line that has the same y -intercept as $2x + 3y - 6 = 0$?

- a $y = \frac{1}{2}x + 2$
- b $y = 2x - 2$
- c $y = -\frac{1}{2}x + 6$
- d $y = -2x - 6$

21 Nate buys a video-game system.

- The system costs \$300.
- Games cost \$60 each.
- He pays 13% tax on the system and on each game.
- He has \$850 in total to spend.

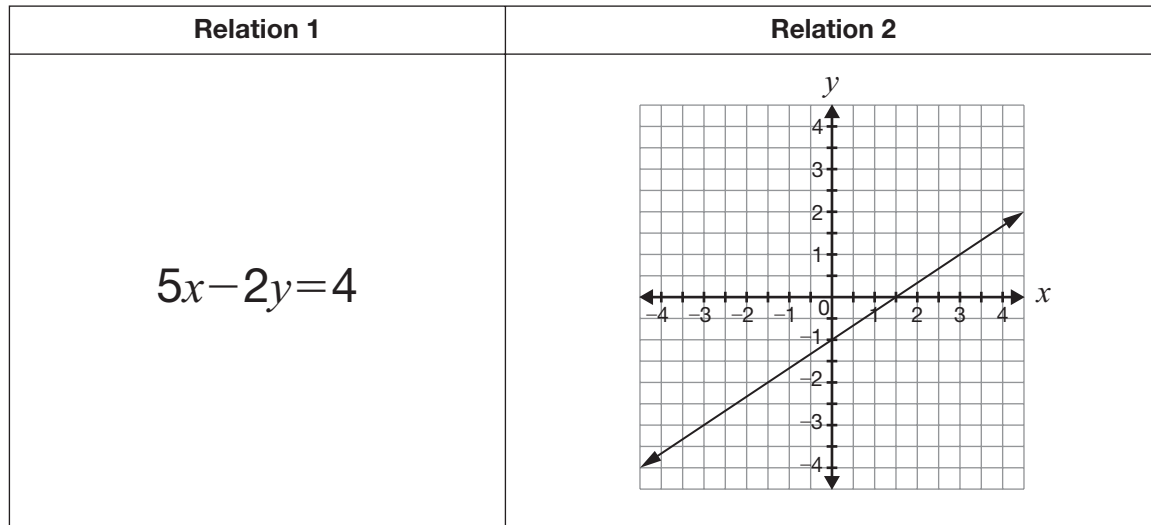
After he pays for the system, how many games is Nate able to buy?

- a exactly 12
- b exactly 9
- c no more than 7
- d no more than 3



22 Hit the Slopes

Consider the two relations represented below.



Determine the slope of the line representing each relation.

Show your work.

Slope of line representing Relation 1: _____

Slope of line representing Relation 2: _____

Which of these relations is represented by the steeper line?

Justify your answer.

23 How Many Uniforms?

The equation $C = 20n + 35$ represents the relationship between the cost of school volleyball uniforms, C , in dollars, and the number of uniforms ordered, n .

- The uniform company requires that the school order a minimum of 15 uniforms.
- The school has a maximum of \$600 to spend on the uniforms.

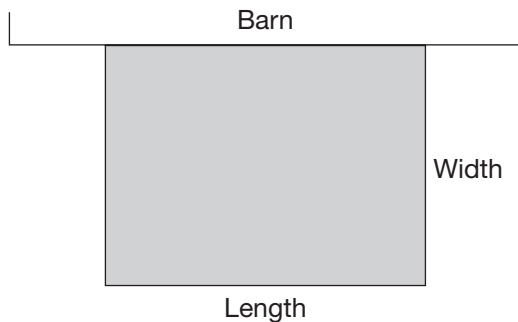
Determine the possible values for n and C in this situation.

Show your work.

The possible values for n are _____.

The possible values for C are _____.

- 24** Tom uses fencing to create a rectangular horse enclosure. He uses the side of a barn as one of the sides of the enclosure.

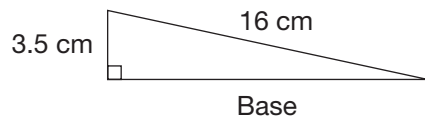


Tom has 48 metres of fencing to use for the three sides of the rectangular enclosure.

Which set of dimensions will use the entire 48 m of fencing?

- a width is 8 m, length is 6 m
- b width is 12 m, length is 12 m
- c width is 24 m, length is 12 m
- d width is 12 m, length is 24 m

- 25** Consider the following triangle.

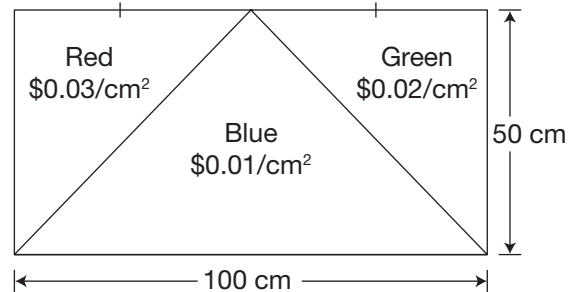


Which expression can be used in the process of determining the length of the base?

- a $16^2 - 3.5^2$
- b $16^2 + 3.5^2$
- c $\sqrt{16 + 3.5}$
- d $\sqrt{16 - 3.5}$

- 26** Pablo is designing a rectangular flag that consists of three coloured triangles.

The picture below shows the colours of the triangles and the cost of each colour of material.



What is the total cost of the material?

- a \$75.00
- b \$87.50
- c \$150.00
- d \$175.00

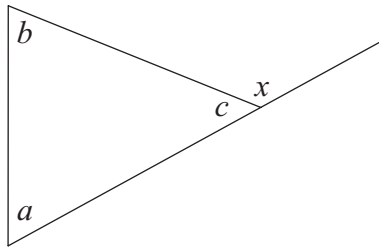
- 27** A cylinder has a volume of $400\pi \text{ cm}^3$ and a diameter of 20 cm.

Which of the following is closest to the height of the cylinder?

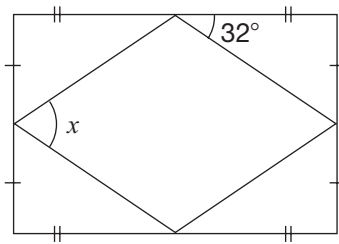
- a 1 cm
- b 4 cm
- c 20 cm
- d 40 cm

- 28** Consider the diagram below.

Which of the following equations is always true?



- a** $x = a + b$
 - b** $x = b + c$
 - c** $x = a - b$
 - d** $x = b - c$
- 29** A rectangular sign is built as shown below. The four supports for the back of the sign form four congruent triangles.



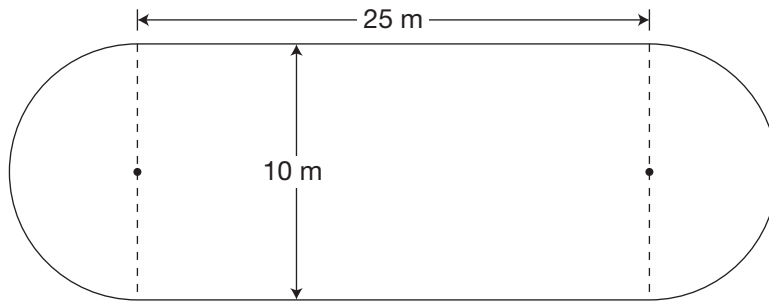
What is the value of x ?

- a** 26°
- b** 32°
- c** 58°
- d** 64°



30 Building an Ice Rink

Jake builds an ice rink as shown below.



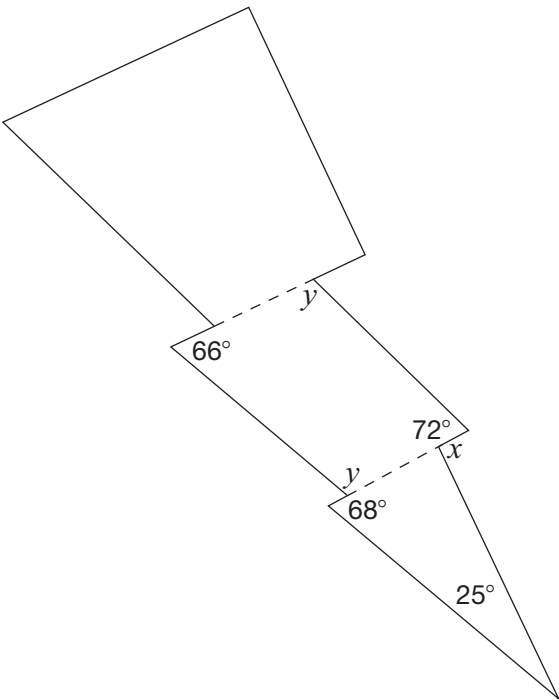
Determine the perimeter of the rink.

Show your work.



31 Shazam

Pravin designs a lightning bolt using two quadrilaterals and one triangle as shown below.



Complete the table below.
Justify your answers using geometric properties.

Angle measure	Justification
$x = \underline{\hspace{2cm}}$	
$y = \underline{\hspace{2cm}}$	

Sample Assessment Questions: Academic

Student Answer Sheet

Your multiple-choice answers must be entered on this sheet.

- To indicate your answer, **use a pencil to fill in the circle completely.**

Like this: ● **Not like this:** ⊗ ✓ ◐ ◑

- Do not fill in more than one answer to a question.
- Do not leave a question blank.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)

2. (a) (b) (c) (d)

3. (a) (b) (c) (d)

4. (a) (b) (c) (d)

5. (a) (b) (c) (d)

6. Respond in booklet.

7. (a) (b) (c) (d)

8. (a) (b) (c) (d)

9. (a) (b) (c) (d)

10. (a) (b) (c) (d)

11. (a) (b) (c) (d)

12. (a) (b) (c) (d)

13. Respond in booklet.

14. Respond in booklet.

15. (a) (b) (c) (d)

16. (a) (b) (c) (d)

17. (a) (b) (c) (d)

18. (a) (b) (c) (d)

19. (a) (b) (c) (d)

20. (a) (b) (c) (d)

21. (a) (b) (c) (d)

22. Respond in booklet.

23. Respond in booklet.

24. (a) (b) (c) (d)

25. (a) (b) (c) (d)

26. (a) (b) (c) (d)

27. (a) (b) (c) (d)

28. (a) (b) (c) (d)

29. (a) (b) (c) (d)

30. Respond in booklet.

31. Respond in booklet.

End of Assessment

Print Student Name: _____

Student Signature: _____



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Academic

Grade 9 Assessment of Mathematics

2010

SAMPLE ASSESSMENT QUESTIONS

**Record your answers to the multiple-choice questions
on the Student Answer Sheet (2010, Academic).**

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September 2012

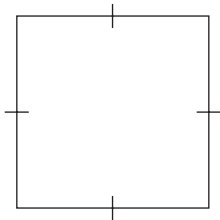
Please note: The format of
this booklet is different from
that used for the assessment.
The items themselves remain
the same.

Page 49 of 68

- 1** What is the value of $6x^2$ when $x = \frac{1}{3}$?

a $\frac{2}{9}$
 b $\frac{2}{3}$
 c 2
 d 4

- 2** Chris has a square garden with an area of 38.4 m^2 , as shown in the diagram.



He decreases the length of each side by 1.7 m to make a smaller garden.

Which is closest to the perimeter of the smaller garden?

a 37 m
 b 32 m
 c 25 m
 d 18 m

- 3** The sum of the perimeters of two shapes is represented by $13x + 4y$.

The perimeter of one shape is represented by $4x - 2y$.

Which expression represents the perimeter of the other shape?

a $9x + 2y$
 b $9x + 6y$
 c $17x + 2y$
 d $17x + 6y$

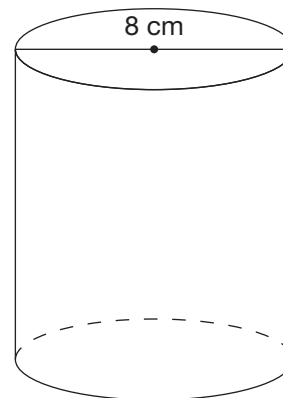
- 4** Consider the expression below.

$$3x^2(5x^2 - 2x + 1)$$

Which of the following is equivalent to this expression?

a $8x^2 - 2x + 1$
 b $8x^2 + x + 4$
 c $15x^4 - 2x + 1$
 d $15x^4 - 6x^3 + 3x^2$

- 5** The cylinder below has a volume of 150 cm^3 .



Which of the following is closest to the area of the lateral surface of the cylinder?

Hint:

$$V_{\text{cylinder}} = \pi r^2 h$$

$$A_{\text{lateral surface}} = 2\pi r h$$

a 38 cm^2
 b 75 cm^2
 c 150 cm^2
 d 300 cm^2

6 Part-Time Job

Ezre works part-time at a clothing store. He earns \$80 per week plus 6% of the value of his weekly sales.

This week Ezre earns \$119.

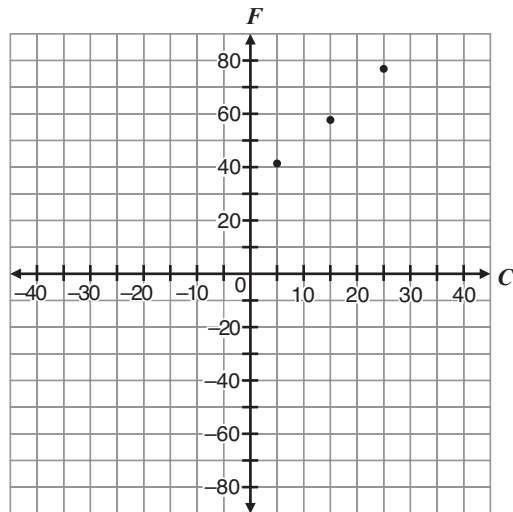
What is the total value of his sales this week?

Show your work.

The total value of his sales is _____.

- 7** Consider the following chart and graph.

Temperature in degrees Celsius, C	Temperature in degrees Fahrenheit, F
5°	41°
15°	59°
25°	77°



What temperature in degrees Celsius is equivalent to -20°F ?

- a -4°C
 - b -18°C
 - c -29°C
 - d -40°C
- 8** A bus is rented for a class field trip. The transportation cost for the trip is made up of \$225 to rent the bus, \$50 for gas and \$2 for each bus seat.

Which relation below describes the total transportation cost for the trip if C is the total cost in dollars and n is the number of seats?

- a $C = -2n + 225$
- b $C = -2n + 275$
- c $C = 2n + 225$
- d $C = 2n + 275$

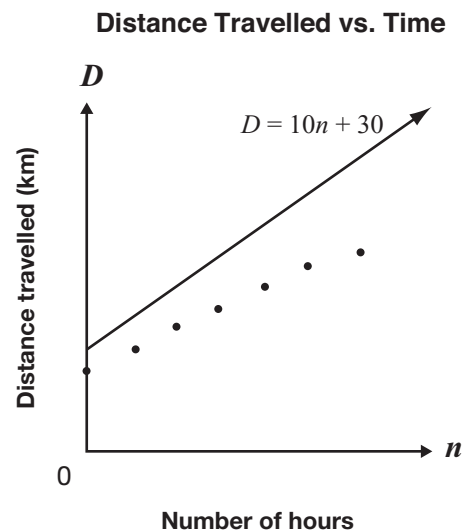
- 9** A sports company uses the equation $C = 8t + 5$ to represent the relationship between the total amount charged to rent a canoe, C , in dollars and the rental time, t , in hours.

What is the initial charge to rent a canoe?

- a \$0
- b \$5
- c \$8
- d \$13

- 10** Data on distance travelled and the number of hours spent travelling are shown on the graph below.

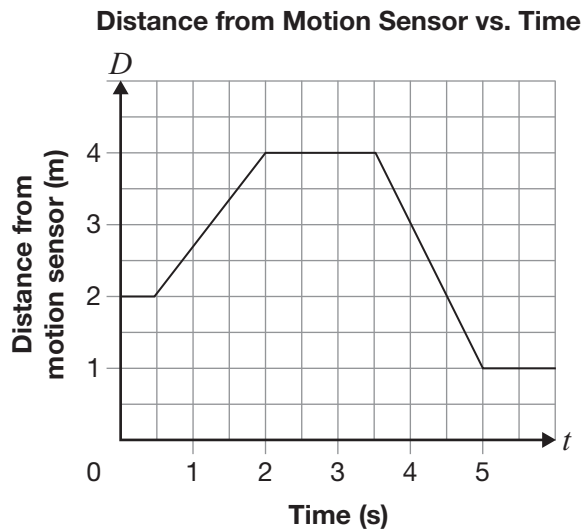
The line $D = 10n + 30$ is also shown on the graph.



Which equation best represents the line of best fit for the data shown?

- a $D = 5n + 33$
- b $D = 8n + 23$
- c $D = 10n + 18$
- d $D = 12n + 25$

- 11** Tyler walks along a line leading from a motion sensor. The graph below shows information about Tyler's walk.

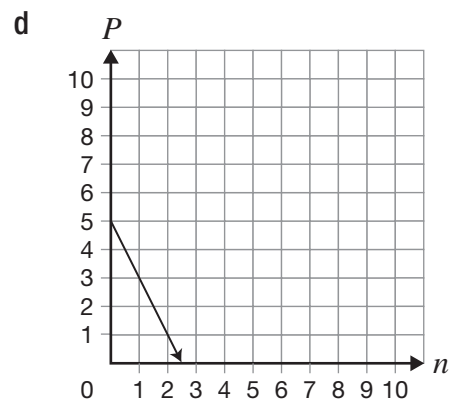
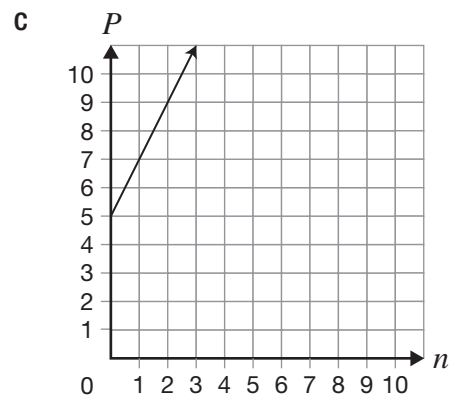
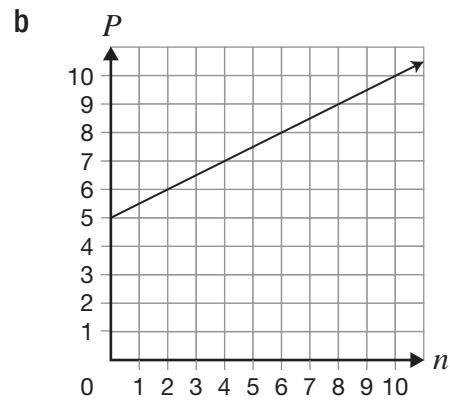
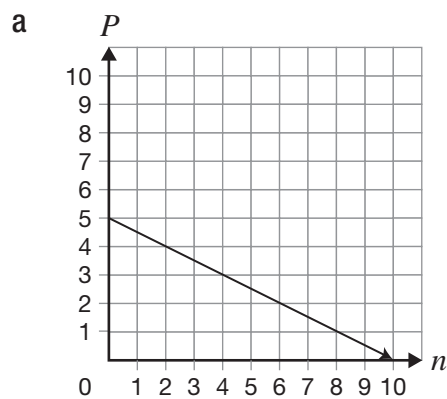


Which of the following is closest to Tyler's speed in metres per second as he walks toward the motion sensor?

- a 2.0
- b 1.3
- c 0.8
- d 0.5

- 12** Which graph represents the equation

$$P = -\frac{1}{2}n + 5?$$



13 What's the Charge?

The table below represents the linear relationship between cost and repair time at an appliance store.

Repair time, t (h)	Cost, C (\$)
3	205
6	385
8	505

Determine the initial value of this relationship. Show your work.

Initial value: _____

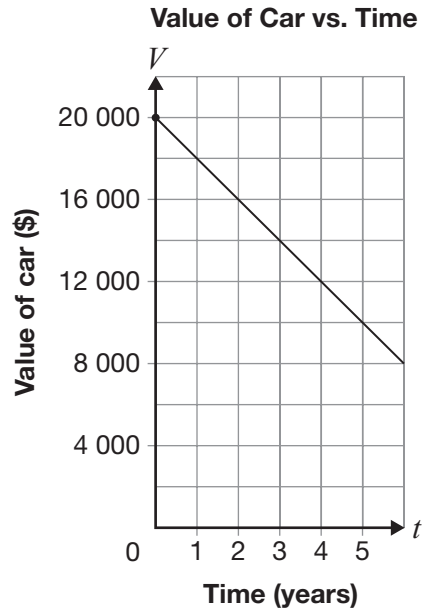
Is this relationship a direct or a partial variation?

Circle one: Direct variation Partial variation

Justify your answer.

14 Hot New Wheels

Cybelle and Peter each buy a car. The graph below represents the value of Cybelle's car over time.



Peter's car costs less than Cybelle's. The value of both cars changes at the same rate.

Determine a possible equation to represent the relationship between the value of Peter's car, V , in dollars, and time, t , in years.

$V =$ _____

Justify your equation.

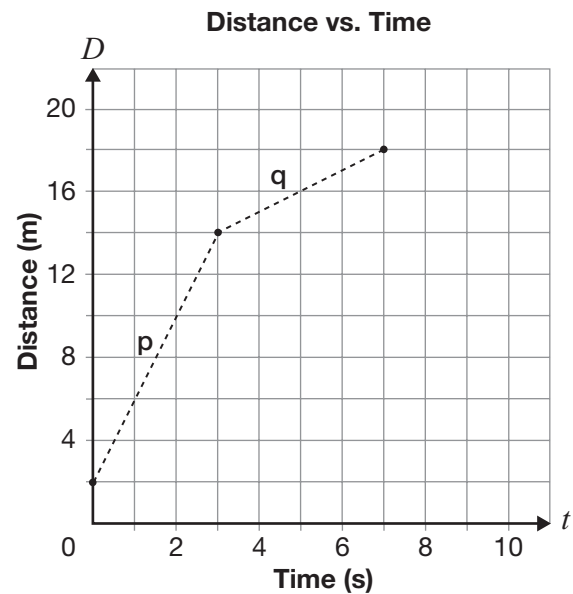
- 15** Which of the following represents an equation of a line?

a $y = 2^x$
b $y = x^2 - 5$
c $x^2 + y^2 - 25 = 0$
d $2x + 3y - 5 = 0$

- 16** What are the slope, m , and y -intercept, b , of the line represented by $3x - 2y + 16 = 0$?

a $m = \frac{3}{2}, b = 8$
b $m = \frac{2}{3}, b = -16$
c $m = -\frac{2}{3}, b = -8$
d $m = -\frac{3}{2}, b = 16$

- 17** The graph below represents the relationship between distance and time on Javier's walk.



How much greater is Javier's speed in section p than in section q?

a 0.5 m/s
b 1.5 m/s
c 2.0 m/s
d 3.0 m/s

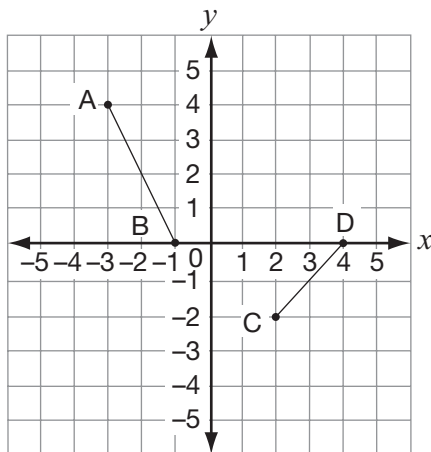
- 18** The total cost of hiring Beth's Plumbing Services is represented by the equation $C = 50t + 70$, where C is the total cost in dollars and t is the time in hours.

Next month, the rate will change to \$60 per hour, but the initial charge will stay the same.

Which of the following describes how the graph of the relation will change?

a The steepness of the line will increase.
b The steepness of the line will decrease.
c The vertical intercept will increase by 10 units.
d The vertical intercept will decrease by 10 units.

- 19 Consider the following graph.



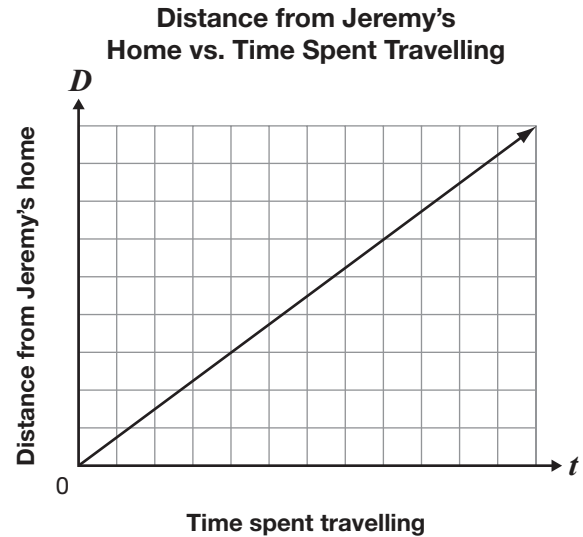
Which statement is **false**?

- a The slope of AB is -2 .
- b The slope of CD is 1 .
- c The y -intercept of the line through CD is -4 .
- d The y -intercept of the line through AB is -1 .

- 20 Janelle draws a line that passes through the points $(-1, 6)$ and $(0, 3)$. If Janelle writes the equation of the line in $y = mx + b$ form, what are the values of m and b ?

- a $m = -9$
 $b = 3$
- b $m = -3$
 $b = 6$
- c $m = -9$
 $b = 6$
- d $m = -3$
 $b = 3$

- 21 Last weekend, Jeremy travelled from his home to a friend's house. The graph below represents the relation between D , the distance from Jeremy's home, and t , the time spent travelling to his friend's house.



This weekend, Jeremy travels to his friend's house but leaves from school. Jeremy's school is between his house and his friend's house.

If he travels at a faster rate this weekend, how will the line representing this trip compare to the line representing the previous trip?

This new line will

- a start at a higher point and be steeper.
- b start at a higher point and be less steep.
- c start at the current point and be steeper.
- d start at the current point and be less steep.

22 The New Line

A line has

- the same slope as the line represented by $4x - 3y + 15 = 0$ and
- the same y -intercept as the line represented by $2x + y + 6 = 0$.

Determine an equation of this line.

Show your work.

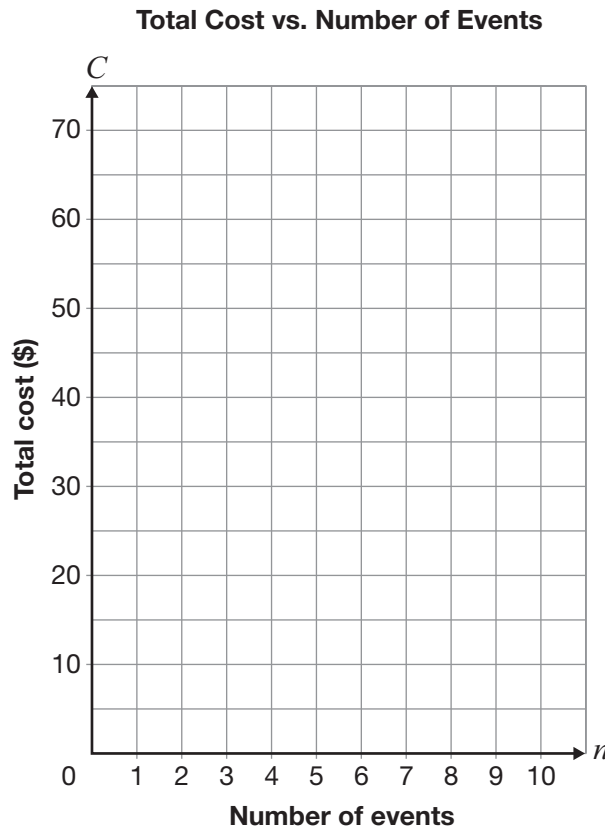
23 Event-full

At Lowell High School, the cost to attend special events depends on whether or not a student has purchased a \$10 discount card.

Option A: The student buys a discount card. The cost is \$5 per event.

Option B: The student does not buy a discount card. The cost is \$7.50 per event.

Graph the relationship between total cost and number of events for each option on the grid.



Determine the conditions under which a student at Lowell High School should choose each option.

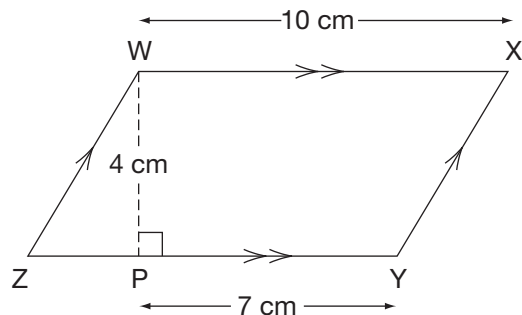
Justify your answer.

- 24** Ella wants a rectangle with
- a perimeter of 100 cm and
 - the largest possible area.

What are the dimensions of the rectangle that satisfies her conditions?

- a $10\text{ cm} \times 10\text{ cm}$
- b $20\text{ cm} \times 30\text{ cm}$
- c $25\text{ cm} \times 25\text{ cm}$
- d $40\text{ cm} \times 60\text{ cm}$

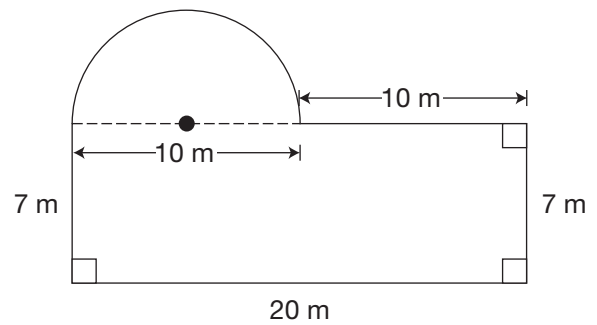
- 25** Consider the parallelogram shown below.



What is the perimeter of WXYZ?

- a 28 cm
- b 30 cm
- c 31 cm
- d 34 cm

- 26** A garden is in the shape of a rectangle and a semicircle as shown below.



Which of the following is closest to the amount of fencing needed to enclose the garden?

- a 60 m
- b 70 m
- c 75 m
- d 85 m



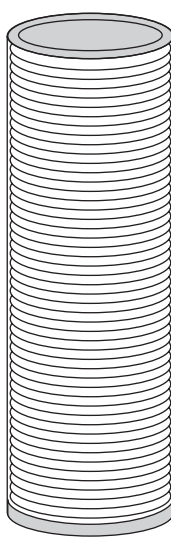
- 27** The playing chips of a board game are stored in cylindrical plastic cases. The plastic cases have a volume of $25\,120\text{ mm}^3$ and a diameter of 40 mm.

Playing Chip

← 40 mm →

**Plastic Case**

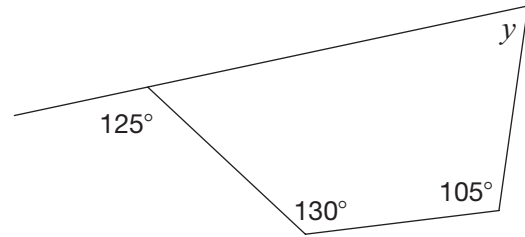
← 40 mm →



Which of the following is closest to the height of one playing chip if 50 playing chips can fit tightly into the plastic case as shown above?

- a 0.1 mm
- b 0.4 mm
- c 1.3 mm
- d 2.5 mm

- 28** Consider the diagram below.



Which of the following is the value of y in the diagram?

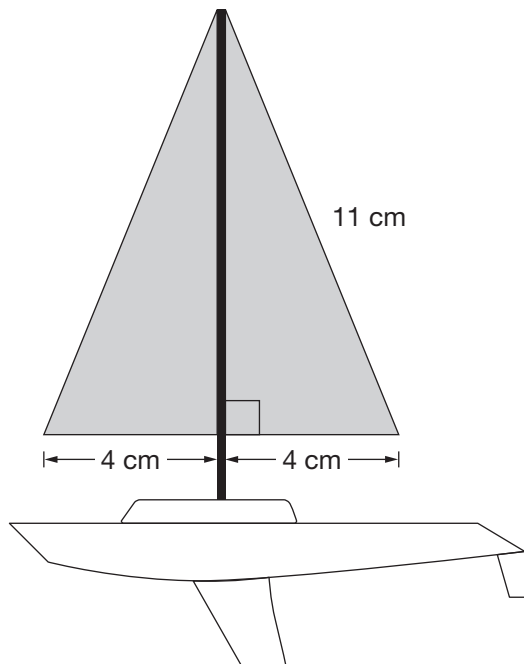
- a 55°
- b 70°
- c 125°
- d 130°

- 29** What is the sum of the interior angles of a 12-sided regular polygon?

- a 1080°
- b 1800°
- c 1980°
- d 2160°

30 Toy Sailboats

Emelina makes toy sailboats as shown below.

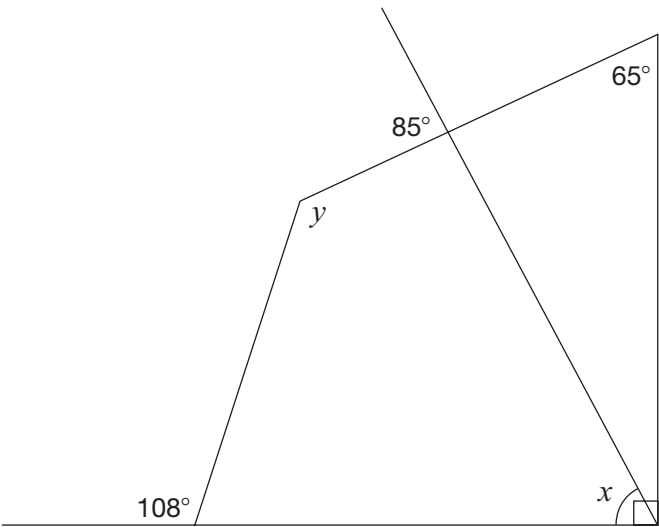


Determine the total area of the shaded sails.

Show your work.

31 What’s Missing?

Consider the diagram below.



Complete the table below.

Justify your answers using geometric properties.

Angle measure	Justification
$x = \underline{\hspace{2cm}}$	
$y = \underline{\hspace{2cm}}$	



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Sample Assessment Questions: Academic

Student Answer Sheet

Your multiple-choice answers must be entered on this sheet.

- To indicate your answer, use an **HB pencil to fill in the circle completely**, as shown:

Like this: ● **Not like this:** ⊗ ✓ ◐ ◑

- If you fill in more than one answer to a question, the question will be scored zero.
- If you leave a question blank, the question will be scored zero.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)
2. (a) (b) (c) (d)
3. (a) (b) (c) (d)
4. (a) (b) (c) (d)
5. (a) (b) (c) (d)
6. Respond in booklet.
7. (a) (b) (c) (d)
8. (a) (b) (c) (d)

9. (a) (b) (c) (d)
10. (a) (b) (c) (d)
11. (a) (b) (c) (d)
12. (a) (b) (c) (d)
13. Respond in booklet.
14. Respond in booklet.
15. (a) (b) (c) (d)
16. (a) (b) (c) (d)

17. (a) (b) (c) (d)
18. (a) (b) (c) (d)
19. (a) (b) (c) (d)
20. (a) (b) (c) (d)
21. (a) (b) (c) (d)
22. Respond in booklet.
23. Respond in booklet.
24. (a) (b) (c) (d)

25. (a) (b) (c) (d)
26. (a) (b) (c) (d)
27. (a) (b) (c) (d)
28. (a) (b) (c) (d)
29. (a) (b) (c) (d)
30. Respond in booklet.
31. Respond in booklet.

End of Assessment

Print Student Name: _____

Student Signature: _____

